Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

Delirium: proportion of patients meeting diagnostic criteria on the Confusion Assessment Method (CAM).

Source(s)

Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med. 1990 Dec 15;113(12):941-8. PubMed

Measure Domain

Primary Measure Domain

Outcome

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the Measure Validity page.

Secondary Measure Domain

Process

Brief Abstract

Description

This measure assesses the proportion of patients meeting the diagnostic criteria for delirium as measured by the Confusion Assessment Method (CAM) instrument.

Rationale

Delirium is a common, serious, and potentially preventable source of morbidity and mortality for older hospitalized patients. Delirium has assumed particular importance because patients over 65 currently account for more than 48% of all days of hospital care. Based on 1994 figures, each year delirium complicates hospital stays for over 2.3 million older persons, involving over 17.5 million inpatient days, and accounting for over $4 billion of Medicare expenditures. Substantial additional costs accrue following

hospital discharge because of the increased need for institutionalization, rehabilitation, and home care. Importantly, the incidence of delirium is likely to increase with the aging of the population. These projections highlight the clinical and health policy implications of delirium. Morevoer, delirium meets the criteria for a health care quality indicator: it is common, frequently iatrogenic, and integrally linked to processes of care. Thus, delirium fulfills Williamson's principle of "maximal achievable benefit: the diagnosis is frequent, deficiencies in care are common and serious, and the deficiencies are correctable." Because of its ease of use, the Confusion Assessment Method is currently the most widely used instrument for detection of delirium worldwide.

Primary Clinical Component

Delirium; Confusion Assessment Method instrument; diagnosis

Denominator Description

All patients studied, typically a cohort of older persons, such as hospital or nursing home admissions

Numerator Description

The number of patients from the denominator meeting the diagnostic criteria for delirium as assessed by the Confusion Assessment Method (CAM) instrument.

Evidence Supporting the Measure

Evidence Supporting the Criterion of Quality

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

Need for the Measure

Use of this measure to improve performance

Evidence Supporting Need for the Measure

Inouye SK, Bogardus ST Jr, Charpentier PA, Leo-Summers L, Acampora D, Holford TR, Cooney LM Jr. A multicomponent intervention to prevent delirium in hospitalized older patients. N Engl J Med. 1999 Mar 4;340(9):669-76. PubMed

Marcantonio ER, Flacker JM, Wright RJ, Resnick NM. Reducing delirium after hip fracture: a randomized trial. J Am Geriatr Soc. 2001 May;49(5):516-22. PubMed

Milisen K, Foreman MD, Abraham IL, De Geest S, Godderis J, Vandermeulen E, Fischler B, Delooz HH, Spiessens B, Broos PL. A nurse-led interdisciplinary intervention program for delirium in elderly hip-fracture patients. J Am Geriatr Soc. 2001 May;49(5):523-32. PubMed

State of Use of the Measure

State of Use

Current routine use

Current Use

Internal quality improvement

Application of Measure in its Current Use

Care Setting

Hospitals

Long-term Care Facilities

Professionals Responsible for Health Care

Nurses

Physicians

Psychologists/Non-physician Behavioral Health Clinicians

Lowest Level of Health Care Delivery Addressed

Single Health Care Delivery Organizations

Target Population Age

Age greater than or equal to 65 years

Target Population Gender

Either male or female

Stratification by Vulnerable Populations

Unspecified

Characteristics of the Primary Clinical Component

Incidence/Prevalence

Delirium, defined as an acute disruption of attention and cognition, occurs in 14% to 56% of older

hospitalized patients and is the most frequent complication of hospitalization in these patients.

Evidence for Incidence/Prevalence

Inouye SK, Schlesinger MJ, Lydon TJ. Delirium: a symptom of how hospital care is failing older persons and a window to improve quality of hospital care. Am J Med. 1999 May;106(5):565-73. [103 references] PubMed

Association with Vulnerable Populations

Delirium, also known as acute confusional state, is a common, serious, and potentially preventable source of morbidity and mortality among hospitalized older patients.

Evidence for Association with Vulnerable Populations

Inouye SK, Bogardus ST Jr, Charpentier PA, Leo-Summers L, Acampora D, Holford TR, Cooney LM Jr. A multicomponent intervention to prevent delirium in hospitalized older patients. N Engl J Med. 1999 Mar 4;340(9):669-76. PubMed

Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med. 1990 Dec 15;113(12):941-8. PubMed

Burden of Illness

The development of delirium in the hospital is associated with mortality rates of 25% to 33%, increased morbidity, functional decline, increased need for nursing surveillance, greater hospital costs, increased length of stay and greater rates of nursing home placement.

Evidence for Burden of Illness

Inouye SK, Schlesinger MJ, Lydon TJ. Delirium: a symptom of how hospital care is failing older persons and a window to improve quality of hospital care. Am J Med. 1999 May;106(5):565-73. [103 references] PubMed

Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med. 1990 Dec 15;113(12):941-8. PubMed

Utilization

Based on 1994 figures, each year delirium complicates hospital stays for over 2.3 million older persons, invovling over 17.5 million inpatient days, and accounting for over $4 billion of Medicare expenditures. Substantial additional costs accrue following hospital discharge because of the increased need for institutionalization, rehabilitation, and home care.

Evidence for Utilization

Inouye SK, Bogardus ST Jr, Charpentier PA, Leo-Summers L, Acampora D, Holford TR, Cooney LM Jr. A multicomponent intervention to prevent delirium in hospitalized older patients. N Engl J Med. 1999 Mar 4;340(9):669-76. PubMed

Inouye SK, Schlesinger MJ, Lydon TJ. Delirium: a symptom of how hospital care is failing older persons and a window to improve quality of hospital care. Am J Med. 1999 May;106(5):565-73. [103 references] PubMed

Costs

See "Utilization" field.

Institute of Medicine (IOM) Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding

Users of care only

Description of Case Finding

A cohort of older persons, such as hospital or nursing home admissions

Denominator Sampling Frame

Patients associated with provider

Denominator Inclusions/Exclusions

Inclusions
All patients studied, typically a cohort of older persons, such as hospital or nursing home admissions

Exclusions
Unspecified

Relationship of Denominator to Numerator

All cases in the denominator are equally eligible to appear in the numerator

Denominator (Index) Event

Institutionalization

Denominator Time Window

Time window is a single point in time

Numerator Inclusions/Exclusions

Inclusions

The number of patients from the denominator meeting the diagnostic criteria* for delirium as assessed by the Confusion Assessment Method (CAM) instrument

*The measure is scored based on ratings of four key features of delirium:

- Acute onset and fluctuating course
- Inattention
- Disorganized thinking
- Altered level of consciousness

The diagnosis of delirium by CAM requires the presence of features (1), (2), and either (3 or 4).

Exclusions
Unspecified

Measure Results Under Control of Health Care Professionals, Organizations and/or Policymakers

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

Numerator Time Window

Encounter or point in time

Data Source

Patient survey

Level of Determination of Quality

Individual Case

Outcome Type

Proxy for Outcome

Pre-existing Instrument Used

Unspecified

Computation of the Measure

Scoring

Rate

Interpretation of Score

Better quality is associated with a lower score

Allowance for Patient Factors

Unspecified

Standard of Comparison

Internal time comparison

Evaluation of Measure Properties

Extent of Measure Testing

When validated against the reference standard ratings of geriatric psychiatrists' ratings based on comprehensive psychiatric assessment, the Confusion Assessment Method (CAM) had a sensitivity of 94-100%, specificity of 90-95%, positive predictive value of 91-94%, and a negative predictive value of 90-100%. The interobserver reliability of the CAM was high (Kappa = 0.81-1.0). Since delirium is a fluctuating condition by nature, test-retest reliability cannot be validly assessed.

Evidence for Reliability/Validity Testing

Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med. 1990 Dec 15;113(12):941-8. PubMed

Identifying Information

Original Title

The Confusion Assessment Method (CAM) for detection of delirium.

Submitter

Inouye, Sharon K., MD, MPH - Independent Author(s)

Developer

Inouye, Sharon K., MD, MPH - Independent Author(s)

Funding Source(s)

None

Composition of the Group that Developed the Measure

Sharon K. Inouye, MD, MPH, Professor of Medicine, Harvard Medical School

Financial Disclosures/Other Potential Conflicts of Interest

None

Adaptation

This measure was not adapted from another source.

Release Date

1990 Dec

Measure Status

This is the current release of this measure.

Source(s)

Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med. 1990 Dec 15;113(12):941-8. PubMed

Measure Availability

The individual measure, "The Confusion Assessment Method (CAM) for Detection of Delirium" is published in the "Annals of Internal Medicine," 1990; 113:941-48.

For further information and to view the Training Manual, see http://hospitalelderlifeprogram.org/pdf/The_Confusion_Assessment_Method.pdf .

NQMC Status

This NQMC summary was completed by ECRI on February 27, 2003. The information was verified by the measure developer on March 3, 2003.

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